is entirely based, and without a reasonable interpretation of which no explanation can be considered satisfactory. The hæmodromograph trace proves that the "tidal wave" of Dr. Galabin has a shock origin, as I have shown in the "Journal of Anatomy and Physiology" (Nov. 1872), and that the dicrotic wave is its resulting tidal wave.

Dr. Galabin appeals to the "tidal wave" in the trace from the artery at the foot, in proof of his explanation; I have taken many from that locality, and find that the tidal wave is never represented at all (as my explanation requires), for it is thrown so far back that it becomes blended with the primary rise.

My explanation of the details of the cardiograph is questioned, because my tracings are said to have been taken with "a lever moving on a pivot, and balanced between two springs." Such was undoubtedly the case in my cardio-sphygmograph observations, but not in my paper on the cardiograph trace, when the instrument employed was, what Dr. Galabin recommends, the ordinary sphygmograph, applied to the chest-wall.

As long as Dr. Galabin has not full faith in the reliability of the sphygmograph and its indications, it is almost impossible to maintain an argument with him, for it is hardly worth discussing points which may be only the results of instrumental imperfections. These are now understood, and can be easily eliminated.

A. H. GARROD

Venomous Caterpillars

THE caterpillars mentioned by R. Benson in your paper of August 14, are not at all uncommon in Calcutta. One day my little girl was brought to me with what appeared to be a good sized hairy caterpillar under her arm, and crying as if in pain, and on my trying to remove it in a hurried way, I discovered that it was nothing but a mass of small hairs. The child had put her arm into an empty tub on the inner edge of which the caterpillar was crawling. As soon as she pressed it, she started as if she had been stung. All the servants crowded round the child and pointed to their heads, but as I was not a proficient in their language I could not make out what they meant. I tried to do what I could with my fingers to remove the hairs, but this seemed very painful, and the swelling round about kept increasing. The ayah, however, soon appeared, attracted by the child's crying, and seemed to know what was to be done. She got some of my hair, made a kind of small brush of it, and gently passed it over the injured part. In a few moments the hairs were all removed, and nothing was left but a white blister. This remained for two or three days and then subsided. In the Calcutta schools the boys call these caterpillars "woolly bears," and if stung by them ask for "a head," and a few rubs soon removes the disagreeable appendages.

C. H. C. B.

Calcutta, Sept. 9.

Harmonic Echoes

LORD RAYLEIGH'S notes on Harmonic Echoes recall to my recollection a little experience which I had in hearing what I supposed to be overtones reflected.

I have frequent occasion to cross a portion of an open public park in which there are few trees. When any sharp sounds are heard in the neighbourhood, as, for instance, the sound of the rod in the beating of carpets in a field near at hand, curious responses to the blows of the rod are heard, and these responses or echoes have not the same pitch as the originating sound. I was puzzled for some time to account for this echo in an open park, with almost nothing above the level of the grass but the iron railings, till I satisfied myself, by occupying various positions, that the echoes were reflections of sound from these narrow fences. But why the difference in pitch between the originating sound and the echo? This, I concluded, *might* result from the overtones of the sound being reflected from the thin iron bars which constitute the railing. It was also observable that it was only the sharp sound emitted by the beating rod which was echoed, and not the dull sound arising from the carpet when struck. The hands struck sharply together will also cause an echo from the fences, which is higher in pitch than the sound of the clapping hands. It would be very interesting to experiment on this point by sounding, at a proper distance, notes of known pitch before narrow, upright, or horizontal bars, and then ascertaining the pitch of the echo, and the relation of the latter to the size of the reflecting surface.

W. J. M.

Glasgow

IT appears tolerably well established that harmonic echoes are selective echoes; that is to say, echoes which, from whatever cause, select and return one of the harmonies of the original without the fundamental.

It may perhaps be found that there are other selective echoes than the harmonic kind. In one of the galleries of the very large parish church of Monkstown, co. Dublin, the sound of S is heard with peculiar intensity, both in the singing and in the responses. This is not an echo, but it may perhaps be a fact of the same kind with selective echoes.

Old Forge, Dunmurry JOSEPH JOHN MURPHY

Carbon Battery Plates

COULD you oblige me with information (or state where it could be obtained) respecting the process of manufacture of hard carbon battery plates, as I have some experiments on hand which necessitate the manufacture of plates of a peculiar shape, and I can neither get them made nor obtain sufficient information to enable me to make them well.

Warrington T. W. FLETCHER

Brilliant Meteor

ON the evening of September 7, at about 9.7 P.M., while walking in a northerly direction in one of the streets of Tiverton, I saw a very large and brilliant meteor slowly descend from east to west, but in an almost vertical direction. The sky was almost entirely covered with a thin veil of cloud, which obscured the stars, so that I was not able to note its course with reference to them; but the altitude of the point at which it first appeared was about 45°, its path was inclined to the vertical at an angle of about 5°, and it disappeared behind a roof at an elevation of about 20°, at a point about 90° to the north of the moon which could be seen through the clouds. The light of the meteor was greenish and flickering, and far exceeded in intensity that of Venus when at her maximum brilliancy, but I could not see any train.

T. PERKINS

Reading School

NORTHERN LIMIT OF PHANEROGAMIC VEGETATION

CAPTAIN MARKHAM has most kindly presented to the Herbarium of the Royal Gardens, Kew, a small but very interesting collection of plants brought back by him from his recent Arctic voyage. Amongst them are four specimens which he obtained from Dr. Bessel, who collected them in lat. 82° N., the most northern position from which any phanerogamic vegetation has hitherto been procured. The locality appears to have been on the east side of Smith's Sound. The species are *Draba alpina*, L.; *Cerastium alpinum*, L.; *Taraxacum Dens-leonis*, Desf. var.; *Poa flexuosa*, Wahl.

JOS. D. HOOKER

THE WEALDEN BORING

THE readers of NATURE will be interested in learning that the lowest beds now reached by the Sussex boring are not Wealden, but of marine origin; that the most distinct of the shells yet examined by me is a Lingula, that it is *Lingula ovalis*, a shell of the Kimmeridge clay. The specimens which contain it were placed in my hands by Mr. Peyton, with Mr. Willett's consent. We are, in fact, already below the Wealden, in the pelagic sea-bed far from its ancient shore.

J. PHILLIPS

THE NEW MARINE ANIMAL FROM WASHINGTON TERRITORY

AT the meeting of the British Association in 1872, I exhibited before Section D specimens of some long white bodies resembling peeled willow-wands, which I had received from Barraud's Inlet, Washington Territory, with the information that they were the "backbones of a fish." Subsequently I published what intelligence I

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could collect upon the subject in this journal,* and urged the expediency of further investigation in order to discover the true nature of these curious objects. I also called the attention of various correspondents in America to the same subject, and sent them copies of the article in NATURE.

It appears that the problem has now been satisfactorily solved, and that Prof. Kölliker, Mr. Mosely, and other naturalists, who held that these organisms were the axes of an unknown Alcyonarian polyp of the family Pennatulidæ were correct.

In a paper communicated to the Californian Academy of Sciences on the 18th of August last, of which I have received a separate copy, Mr. R. E. C. Stearns states that a specimen of the Polyp, of which these bodies are the axes, had been presented to the Academy by Dr. James Blake. Mr. Stearns describes the polyp at full length, and proposes to call it *Verrillia blakei.* He describes the general aspect of the species as resembling that of *Pavonaria quadrangularis*, but states that the polyps are arranged in "two unilateral longitudinal series."

I may add, that a communication from Dr. Edward L. Moss on the same subject, has been received by the Zoological Society of London, and will be read at one of the meetings next session. P. L. SCLATER

THE RAY SOCIETY†

THE Council, in presenting their thirtieth Annual Report, congratulate the members upon the continued prosperity of the Society.

The lapse of time, so marked by the production of a long series of volumes on zoology and botany, issued under the auspices of the Society, has scarcely lessened the original dimensions of the Printed List of Monographs in preparation and in progress; the completion of old memoirs being ever counterbalanced by offers of works from new authors. A recent proposal by Mr. G. B. Buckton to describe the British Aphides is a case in point. This addition will occupy the place left void by the publication of Sir John Lubbock's very valuable and interesting contribution to the study of insect life.

Since the last annual meeting some attempt has been made, not unsuccessfully, to reduce the arrears in the issue of the volumes. The monograph for the year 1871, the "Collembola and Thysanura," by Sir John Lubbock, Bart., M.P., has already been distributed to the members; the work for the year 1872, the "British Annelids," Part I., containing the Nemerteans, by Dr. W. C. McIntosh, has been so far finished that it will be ready in a few weeks' time for the binder; whilst the volume for the year 1873, the "Spongiadæ," vol. iii., by Dr. Bowerbank, is, with the exception of a single plate, completed.

The Council have considered that it would be to the advantage of the Society if members could obtain the past annual volumes at the original (or in some cases at less than the original) subscription price. With this view resolutions have been passed: first, that the annual volumes, or sets of annual volumes, issued during the last ten years should be purchasable by members at the subscription price of one guinea; and, secondly, that the books in stock, published earlier than the year 1863, should be supplied at a lower cost than that named in previous reports; and, thirdly, that certain of the volumes belonging to the years 1865, 1866, 1867, and 1868, formerly not distributed separately, should be offered to members for sums less than that of the year's subscription.

In accordance with these resolutions, a list of books and prices has been prepared. The volumes may be obtained on application to the secretary.

The volumes in preparation for future years are:—

Mr. St. George Mivart's "Monograph of the Tailed Amphibia."

Rev. O. P. Cambridge's supplementary volume on "British Spiders."

Messrs. Douglas and Scott's work on the "British Hemiptera Homoptera."

Dr. Gaertner's work on "Hybridism in Plants" (Bastarderzeugung), translated from the German by W. Carruthers, F.R.S.

Prof. Haeckel's "Morphologie." A new edition, revised by himself, and translated from the German.

Mr. Hancock's Monograph of the "British Tunicata."

Mr. Andrew Murray's work on the "Coniferæ."

Rev. H. B. Tristram's "Synopsis of the Fauna and Flora of Palestine."

Prof. Westwood's Monograph of the "Mantidæ," with illustrations by Mr. E. A. Smith.

Mr. Buckton's Monograph on the "British Aphides."

The Council, in conclusion, would urge the members to assist in the work of obtaining new subscribers, seeing that very many old friends are being removed from the list of the Society year by year through death and various causes.

ON THE INTERNAL NOSE OF THE PECCARIES AND PIGS

IN examining the sections of the skulls of the Wild Boar the Babirussa, the Phacochoer, and the Peccary, I was struck with the great difference in the form and development of the internal part of the organ of smelling of the peccary as distinguished between it and the other genera.

The Wild Boar, Babirussa, and Phacochoer, have the nasal cavities on each side of the head large, broad, and continued from the outer to the internal nostrils in a simple manner, and they are only separated from the palate by a thin bone, as they are in the sheep and the generality of allied animals. In these animals the turbinal bone arises from the centre of the outside of each nasal cavity, and is divided above into two plates which are rolled backwards, towards the outer side of the nose. There is a perforation between the hinder edge of the intermaxillary bone and the palatine bone in front of the palate behind the cutting teeth which opens directly into the front of the nasal cavity just within the nostrils, as figured in Huxley's "Elementary Atlas," t. i. 4 *d.*

In the peccary the internal nostrils open into a small cavity, which soon becomes tubular, pervading a large hollow cellular part which occupies the space above the palatine bones, and then gives off a large opening on the outer side to the turbinal bones, and is continued in a smaller tube to a small opening on each side of the front part of the palate, behind the cutting tooth. This aperture is evidently analogous to the large perforation in front of the palate of the pigs, but is quite of a different structure. There is a cavity further in near the external nostrils, which forms an opening to the pituitary convolutions, to which I see nothing like in the skull of the pigs. The naso-turbinal is fixed by its upper edge to the upper part of the nasal cavity, and is rolled inwards, and there is a lamina on the lower side from the expanded part of the tubular internal nostril, which meets the one from the upper edge. The whole structure of this part is quite different from that in the pigs, and Phacochoer, and justifies the separation of the Peccaries as a different group from the pigs. I may also remark that in this genus there is a well-marked bony plate on each side of the brain cavity, that separates the edge of the cerebrum from the cerebellum. This septum is only slightly marked in the skull of the wild boar, and is entirely absent in the Babirussa and Phacochoer.

J. E. GRAY

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* See NATURE vol. vi. p. 436.

† Extracted from the Report.

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